

USSN: 10/720,607  
Atty. Docket No.: 2003B126  
Reply to Office Action of June 13, 2005  
Amendment dated August 15, 2005

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

Claim 1 -12 (Cancelled)

Claim 13 (Currently Amended): A catalyst composition comprising:

- (a) a support;
- (b) a first metal component comprising rhodium;
- (b) a second metal component comprising ~~a metal selected from Groups 12 to 15 of the Periodic Table of Elements~~ indium; and
- (c) a third metal component comprising a metal different from those of said first and second components and selected from Groups 1 to 15 of the Periodic Table of Elements,

wherein at least said first and second metal components are predominantly contained in an outer surface layer of the support having a depth of not more than ~~1000~~ 300 microns.

Claim 14 -15 (Cancelled)

Claim 16 (Original): The catalyst composition of claim 13 wherein the depth of said outer surface layer of the support is not more than 100 microns.

Claim 17 (Original): The catalyst composition of claim 13 wherein said third metal component is also contained in said outer surface layer of the support.

Claim 18 (Original): The catalyst composition of claim 13 and comprising from about 0.01% to about 10% of rhodium by weight of the total catalyst composition including the support.

Claim 19 (Original): The catalyst composition of claim 13 and comprising from about 0.04% to about 5% of rhodium by weight of the total catalyst composition including the support.

Claim 20 (Currently Amended): The catalyst composition of claim 13 and comprising from

USSN: 10/720,607  
Atty. Docket No.: 2003B126  
Reply to Office Action of June 13, 2005  
Amendment dated August 15, 2005

about 0.01 wt% to about 30 wt% ~~of the metal of the second metal component~~ indium by weight of the total catalyst composition including the support.

Claim 21 (Currently Amended): The catalyst composition of claim 13 and comprising from about 0.04 wt% to about 20 wt% ~~of the metal of the second metal component~~ indium by weight of the total catalyst composition including the support.

Claim 22-24 (Cancelled)

Claim 25 (Original): The catalyst composition of claim 13 and comprising from about 0.04% to about 10% of indium by weight of the total catalyst composition including the support.

Claim 26 (Original): The catalyst composition of claim 13 and comprising from about 0.01% to about 50% of the metal of the third metal component by weight of the total catalyst composition including the support.

Claim 27 (Original): The catalyst composition of claim 13 and comprising from about 0.05% to about 30% of the metal of the third metal component by weight of the total catalyst composition including the support.

Claim 28 (Original): The catalyst composition of claim 13 wherein said third component comprises at least one metal selected from Groups 8 to 10 of the Periodic Table of Elements.

Claim 29 (Original): The catalyst composition of claim 13 wherein said third component is selected from one or more of iron, ruthenium and cobalt.

Claim 30 (Original): The catalyst composition of claim 29 wherein the third component is iron and the catalyst composition comprises from about 0.05% to about 30% of iron by weight of the total catalyst composition including the support.

Claim 31 (Original): The catalyst composition of claim 29 wherein the third component is iron and the catalyst composition comprises from about 0.1% to about 20% of iron by weight of the total catalyst composition including the support.

USSN: 10/720,607  
Atty. Docket No.: 2003B126  
Reply to Office Action of June 13, 2005  
Amendment dated August 15, 2005

Claim 32 (Original): The catalyst composition of claim 29 wherein the third component is cobalt and the catalyst composition comprises from about 0.05% to about 30% of cobalt by weight of the total catalyst composition including the support.

Claim 33 (Original): The catalyst composition of claim 29 wherein the third component is cobalt and the catalyst composition comprises from about 0.1% to about 25% of cobalt by weight of the total catalyst composition including the support.

Claim 34 (Original): The catalyst composition of claim 29 wherein the third component is ruthenium and the catalyst composition comprises from about 0.05% to about 10% of ruthenium metal by weight of the total catalyst composition including the support.

Claim 35 (Original): The catalyst composition of claim 29 wherein the third component is ruthenium and the catalyst composition comprises from about 0.1% to about 5% of ruthenium metal by weight of the total catalyst composition including the support.

Claim 36 (Currently Amended): A method of making a catalyst composition, the method comprising:

- (a) applying a rhodium compound to a surface layer of a support having a depth of not more than ~~1000~~ 300 microns;
- (b) applying a ~~an compound of a second metal selected from Groups 12 to 15 of the Periodic Table of Elements~~ indium compound to said surface layer of the support; and
- (c) applying a compound of a third metal different from rhodium and from said ~~second metal~~ indium and selected from Groups 1 to 15 of the Periodic Table of Elements to the support.

Claim 37 (Currently Amended): The method of claim 36 wherein said third metal compound is applied to the support before either the rhodium compound or the ~~second metal~~ indium compound.

Claim 38 (Currently Amended): The method of claim 36 wherein the ~~second metal~~ indium compound is applied to the support either concurrently with or before the rhodium compound.

USSN: 10/720,607  
Atty. Docket No.: 2003B126  
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Amendment dated August 15, 2005

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Claim 39 (Original): The method of claim 36 wherein at least one of (a), (b) and (c) is effected by an impregnation, precipitation, slurry mixing or coating step.

Claim 40-41 (Cancelled)

Claim 42 (Original): The method of claim 36 wherein said third metal selected from Groups 8 to 10 of the Periodic Table of Elements.

Claim 43 (Original): The method of claim 36 wherein said third metal is selected from one or more of iron, ruthenium and cobalt.

Claim 44 (Original): The method of claim 36 and, after (a) and/or (b) and/or (c), calcining the support at a temperature of about 100°C to about 600°C.

Claim 45 (Original): The method of claim 36 and, after (a), (b) and (c), treating the calcined support in a reducing atmosphere at a temperature in excess of 200°C.

Claim 46 (Withdrawn): A process for selectively removing alkynes or diolefins from a feedstock also containing olefins, the process comprising contacting the feedstock with hydrogen in the presence of a catalyst composition made by the method of claim 36.

Claim 47 (Withdrawn): A process for selectively removing alkynes or diolefins from a feedstock also containing olefins, the process comprising contacting the feedstock with hydrogen in the presence of a catalyst composition as claimed in claim 1.

Claim 48 (Withdrawn): The process of claim 47 wherein the alkynes or diolefins have 2 to 4 carbon atoms and the feedstock also contains C<sub>2</sub> to C<sub>4</sub> olefins.

Claim 49 (Withdrawn): The process of claim 47 wherein said contacting is conducted at a temperature of from about 20°C to about 150°C, a pressure of from about 690 kPa to 4100 kPa, and a molar ratio of hydrogen to alkynes and diolefins of from about 1 to about 1000.

Claim 50 (Withdrawn): The process of claim 47 wherein said contacting is conducted at a

USSN: 10/720,607  
Atty. Docket No.: 2003B126  
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Amendment dated August 15, 2005

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temperature of from about 30°C to about 100°C, a pressure of from about 1400 kPa to 3400 kPa,  
and a molar ratio of hydrogen to alkynes and diolefins of from about 1.1 to about 800.